

IMPACT OF ATMA (AGRICULTURAL TECHNOLOGY MANAGEMENT AGENCY) ON FARMERS LIVELIHOOD IN ANDHRA PRADESH

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ABSTRACT

In India, the public extension system has gone through many renovations and modifications in order to function as a single line agency by integrating different stakeholders, departments and organizations for improving the livelihood standards of farmers in rural areas. ATMA is one of its kind emerged in delivering the extension services at district level. The present study was conducted to assess the impact of ATMA on farmer's livelihood perspective. The study was conducted purposefully in two districts of Andhra Pradesh. A total sample of 120 farmers was randomly selected for the study. The study adopted Sustainable Livelihood Approach (SLA) with suitable indicators for assessing the livelihood status of the respondents. A pretested well-structured interview schedule was prepared for collecting data through personal interview. Simple percentage analysis was followed in analyzing the data. The results revealed that the majority of the respondents had a medium level of sustainable livelihood. Although the livelihood status of the respondents was at medium level, this paper suggests that the efforts and results should be in a sustainable manner. Besides, it may help the authorities, researchers and policy makers broaden their scope so as to ensure sustainability among the rural livelihoods.

KEYWORDS: ATMA, Impact, Sustainable, Livelihood & Andhra Pradesh

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INTRODUCTION

Agricultural extension is an applied science where scientific research and knowledge of agricultural practices were delivered to needy farmer of rural areas. While agricultural extension intends not only to increase productivity and income, livelihood, but also to improve multi-faceted aspects of rural life comprising of the capabilities, assets and activities required for a means of living. As an effort of the public extension system in India, there are various extension reforms focusing on the betterment of rural livelihood security and status. Among them Agricultural Technology Management Agency (ATMA) is one of its kind where the farmer livelihood was improved through farmer oriented extension activities carried out by the convergence mode of development departments in a decentralized mode.

Generally, extension impacts have been coupled with augmentation in productivity and income levels of rural livelihood. A worldwide review of impact of extension services displayed a mixed scenario: very high rates of annual returns in some cases and petty achievements in other cases. It is also widely accepted that impact estimation of extension services on rural livelihoods is challenging in terms of dealing with provenance issues and linking cause and effect relation quantitatively.

In an attempt of studying the impact of extension services delivered by the extension functionaries for the improvement of farmer's livelihood through the effect of convergence mode of extension functionaries under

ATMA. The present study focuses on how the delivered extension services like information and technology dissemination, input supply and capacity building, etc. brought a better livelihood status among rural farmers of Andhra Pradesh with the intervention of ATMA scheme.

Problem Statement and Study Justification

Andhra Pradesh State is identified as the “bejeweled rice bowl of India”. The largest segment of the population of A.P. Lives in rural areas and comprised of small and marginal farmers. They depend for their livelihood on agriculture and the rural non-farm sector. About the population, expansion of farm incomes continues to be an effective strategy for reducing poverty. Rapid and sustainable growth in agriculture and its productivity has been identified not only as a means for economic development, but also for realizing self-sufficiency and ensuring food security among rural lives.

While there are several literatures overlying on extension reforms implementation and their issues in developing countries, demanding impact evaluation studies on extension interventions are not as much noticed for the past two decades. In this regard, factors influencing effectiveness of agricultural extension services along with their impact on fostering improved livelihood outcomes and the problems perceived at different levels in different contexts need to be investigated. Quantitative estimates of effective interventions made by extension reforms relating to intermediate outcomes such as accessibility of assets/resources, knowledge gain, extent of participation in extension activities, decision making behaviour, extent of capacity building, adoption of improved and new technologies, interpersonal interactions with the extension functionaries and the conclusive outcomes such as increased agricultural yields, per capita household income and poverty status also need to be evaluated. This evaluation can help to address the issues; how and in which contexts agricultural extension interventions are effective in improving farmers livelihood? The outcome of which could help planners and researchers in designing effective strategies for successful implementation of extension programs and plans.

There are so many studies available concerning agricultural extension reforms. Many of them are related to the dominant extension approaches followed (for example, production led to market led approach), challenges faced by extension agents, and role of extension service in bringing sustainability. Even though very few impact studies are available (for example, K. M. Singh, M. S. Meena and A. K. Jha, 2009; K. M. Singh *et al.*, 2013), the focuses of the studies concentrated on structural and operational management of extension reforms in maximizing the profits to the farmers. Hardly any evidence exists on the impact of extension services delivered by the synergized extension reform (ATMA) on the overall livelihoods of farmers in India. Hence, the relationships between extension services and the dynamics of rural livelihoods are poorly understood in the country. This type of information is required to assess the strengths, weaknesses, and performance of extension, and to strengthen it to reduce rural poverty and to improve rural livelihoods.

Objective

The objective of the study is to evaluate the impact of agricultural extension services delivered by extension functionaries under ATMA on livelihoods of farmers in Anantapuram and East Godavari districts of Andhra Pradesh. The study, by following Sustainable Livelihood Approach, will contribute towards understanding the complex relationships between extension services and livelihood profiles (i.e., assets, strategies and outcomes) of beneficiary farmers in the study area.

RESEARCH METHODOLOGY

Locale of the Study

Andhra Pradesh State was purposively selected as the researcher hailed from the state and visualized the state bifurcation during 2014 and as a researcher motivated by the need for analytical studies in renovating the state agricultural and extension reforms.

For the study one dry district i.e., Anantapuram and one wet district i.e., East Godavari district. The districts were selected purposively in order to study the ATMA functionality at two different agro-climatic situations.

Selection of Respondents

List of ATMA beneficiary farmers were prepared from each of the selected villages in consultation with Agricultural Officers (AO), Assistant Technology Managers (ATM) of the areas concerned. Ten farmers were selected randomly from each of the twelve selected villages. Thus, making a total of 120 farmer respondents were selected for the study. The sample distribution was given in Table 1.

Table 1: Selection of Farmer Respondents

S. No.	District	Mandal	Village	Sample Drawn
1.	Anantapuram	Kadiri (B1)	A. Kothapalli (V1)	10
			Mallaiahgaripalli (V2)	10
			Nallacheruvu (V3)	10
		Madakasira (B2)	Amarapuram (V1)	10
			Madakasira (V2)	10
			Rolla (V3)	10
2.	East Godavari	Korukonda (B1)	Srirangapatnam (V1)	10
			Burugupudi (V2)	10
			Gadaala (V3)	10
		Alamuru (B2)	Chintaluru (V1)	10
			Jonnada (V2)	10
			Penikeru (V3)	10
		Total	120	

Impact Analysis

The Sustainable Livelihoods Approach (SLA) method was adopted for analysing impact and changing the lives of people experiencing poverty and disadvantage. It is a participatory approach based on the recognition that all people have abilities and assets that can be developed to help them improve their lives.

The research also presented the Sustainable Livelihood Analysis Framework to congregate and analyze data from various stakeholders in ATMA. Based on the available literature and research carried out by various researchers the present framework was adapted according to the particular situations and circumstances on the ground.

Operationalization of Sustainable Livelihood Analysis Framework

Livelihood is defined as a set of activities which involves securing basic needs like water, food, shelter, clothing and also to acquire capability in meeting the above necessities by working either individually or as a group for the realizing the needs and security in a sustainable basis. The activities are usually carried out continually. In social sciences, the concept of livelihood extends to include social and cultural means, i.e. the individual, family, or other social group have command over resources and income to make the most of in satisfying its needs. The concept of Sustainable Livelihood is

an attempt to go beyond the conventional definitions and approaches in eradicating poverty in rural areas. It can be achieved by utilizing various resources along with the interventions of development departments with effective strategies in increasing the production, income, accessibility and livelihood security.

The present study was followed Sustainable Livelihood Approach in analyzing the impact of extension services on farmers livelihoods. The Sustainable Livelihood Framework (SLF) is the core of the Sustainable Livelihood Approach. The framework and indicators for assessing the sustainable livelihood of farmers was represented in Figure 1.

Elements of the Framework

Vulnerability Context

The external environment in which people exist defines vulnerability context. Any critical trends observed either positive or negative as well as limited or no control stuns and seasonality, which have a great influence on farmers livelihoods and on the available assets. Vulnerability transpires when human beings respond and face the harmful threat or shock with inadequate capacity. The variance between risk and vulnerability is of decisive for assessing causes of poverty.

Risk is defined as the probability of incidence of external shocks and stresses plus their potential sternness, whereas vulnerability is the degree of exposure and capacity of households or individuals to prevent, mitigate or cope with the risk and uncertainty.

Livelihood Assets

As the livelihood approach is brought out on a belief that people require a range of assets to achieve livelihood outcomes. It is first and foremost concerned with people, and seeks to gain an accurate and realistic understanding of people's "assets" or "capitals". It is crucial to analyse how people endeavor to exchange these assets or capitals into achievable livelihood outcomes. There are five types of assets or capitals with which livelihoods can be attained, namely natural capital, human capital, social capital and economic capital. These various categories cover the following types of issues and details:

- Human capital: labour power, health and nutritional status, skills and knowledge
- Natural capital: access to land, water, wildlife, flora, forest
- Social capital: refers to those stocks of social trust, norms and networks that people can draw upon to solve common problems. It is mediated through kin networks and group membership
- Economic capital: savings, gold/jewelry, access to regular income, net access to credit, production inputs and insurance.

Policies, Institutions and Processes

The importance of policies, institutions and processes cannot be overemphasized, since they are operated at all levels, from the individual household to the international arena, and in all sectors, from the most private sector to the most public sector. They effectively determine access and influence decision making processes and terms of exchange between different types of assets or capitals, and returns to any given livelihood strategy. They have a direct impact upon whether people are able to achieve a feeling of inclusion and well-being.

ATMA Structural and Operational Interventions

The ATMA structure for implementing block and field level extension activities would serve as a decentralized body to finance extension activities in the district. The establishment of a Farm Information and Advisory Committee (FIAC) team will be the key to effective program implementation that would ground or fine-tune the extension program for specific Agro-Ecological Zones (AEZs) within the block. It is also pointed that effective farmer mobilization in order to participate in the development of block action plans. It is also at this level where representatives of Self Help Groups (SHGs), Farmer Interest Groups (FIGs), and Farmer Associations (FAs) can be directly involved in the Block Farmers' Advisory Committee (BFAC). The organizational structure of ATMA at various levels has been depicted in the Figure 1.

For the effective implementation of the activities to be carried out by ATMA functionaries/stake holders at various levels without any duplication, the following operational interventions are developed and intervened for management of the activities.

Specialist and Functionary Support at Various Levels

The component of manpower support has been further strengthened to accelerate implementation of ATMA Scheme in Mission mode during twelfth Five Year Plan. It is proposed to redesignate the Subject Matter Specialists (SMSs) as Assistant Technology Managers (ATMs). In order to rationalize number of cultivators per functionary at block level, an average figure of three Assistant Technology Managers (ATMs) per block have been envisaged in place of two SMSs per block provided so far.

Cafeteria of Activities

The Cafeteria contains mandatory components and optional items from where the State can choose activities as per its priorities. It includes detailed particulars of manpower, training of extension personnel, organization of Farmers Advisory Committees, Farmer Friends, joint visits with scientists, low cost publications etc.

Innovative Technology Dissemination Activities

The information dissemination through interactive and innovative methods of ICT with the help of Pico Projectors, low cost films, hand held devices, mobile based services etc. and other innovative extension approaches (e.g. Kala Jatha (Road shows)) are included as mandatory activities under ATMA.

Increasing Coverage of Activities, Inclusion of New Activities and Infrastructure Support

The Twelfth Five Year Plan has provisions to supplement extension activities under this ATMA scheme funded through RKVY. In order to ensure efficacious and sustainable interventions, targets under SMAE have had to be curtailed due to financial constraints, though ideally a broader coverage is witnessed. More villages / districts for the aforesaid activities can be covered under RKVY. Similarly, other programmatic interventions like National Food Security Mission (NFSM), National Horticulture Mission (NHM) also have some components relating to agricultural extension which could be done in a convergent manner under the ATMA scheme.

Livelihood Strategies

Livelihood strategies comprise the set of range and combination of activities and choices that people can make choice in order to achieve better livelihood. It should be understood as a dynamic process in which people combine

activities to meet their various needs at different times. Livelihood strategies were directly depending on asset or capital status and policies, institutions and processes. Hence that competition prevails among poor people and that the livelihood strategy of one household might have a either positive or negative impact on the livelihood strategy of another household of the society.

Livelihood Outcomes

Livelihood outcomes are the triumph or outputs of livelihood strategies, such as increased returns, increased well-being, reduced vulnerability, improved food security and a more sustainable use of natural resources developed by the intervention of extension researchers and planners. When assessing livelihood outcomes, the aims of a particular group as well as the extent to which these are already being achieved has to be understood appropriately.

For collection of data pertaining to the sustainable livelihood indicators/components, a structured interview schedule was prepared with the support of literature collected and consulting the experts/scientists and suitable modifications were made accordingly. The indicators were presented in Table 2.

Table 2: Livelihood Security and Outcome Indicators

S. No.	Indicator	Components/Measurement
A.	Livelihood security	
1.	Natural capital	Land holding and Tenure system No. of wells, percentage area under irrigation
2.	Human capital	Trainings underwent, Participation in extension activities like Melas, Ghosties, Exhibition and Farm school
3.	Social capital	Researcher- Extension - Farmer linkage Membership in organizations and institutions
4.	Economic capital	Fertilizers, seeds, livestock, water harvesting structures
B.	Livelihood Outcome	
1.	Crop and enterprise intensification	Adoption of improved/new technologies in existing crop or enterprise
2.	Farm and enterprise diversification	Starting of new enterprise or cropping system along with existing systems
3.	Production	Yield
4.	Income	Income generated from agri and allied sectors
5.	Food security	Per capita consumption of cereals, pulses, fruits and vegetables, dairy products and meat

Data Collection

A well-structured pre-tested interview schedule was the instrument used for data collection. After establishing good rapport, each of the selected respondents was personally interviewed with the help of structured comprehensive interview schedule. Simple percentage analysis was used to analysis the data.

FINDINGS AND DISCUSSIONS

Impact of Convergence Mode of Extension System under ATMA for Farmers Livelihood.

Sustainable Livelihood Approach (SLA)

In the study, the impact of convergence mode of extension system under ATMA for improving the farmers livelihood was analysed through Sustainable Livelihood Approach (SLA). SLA is a participatory approach based on the recognition that all people have abilities and assets that can be developed to help them in improving their lives in a sustainable way. The details with respect to livelihood indicators were collected from the respondents and the

corresponding frequency distribution are presented in Table 3.

Table 3: Distribution of Respondents Based on Livelihood Indicators

S. No.	Indicator	Anantapuram (n = 60)	East Godavari (n = 60)	Total (120)			
		F*	%	F*	%	F*	%
	I.	Livelihood security					
1.	Natural capital	29	48.33	31	51.67	60	50.00
2.	Human capital	49	81.67	52	86.67	101	84.17
3.	Social capital	47	78.33	50	83.33	97	80.83
4.	Economic capital	52	86.67	53	88.33	105	87.50
II.	Livelihood outcome						
1.	Crop and enterprise intensification	53	88.33	56	93.33	109	90.83
2.	Farm and enterprise diversification	49	81.67	51	85.00	100	83.33
3.	Production	51	85.00	54	90.00	104	86.67
4.	Income	50	83.33	53	88.33	99	82.50
5.	Food security	46	76.67	50	83.33	94	78.33

F- Frequency

*** Multiple responses**

Livelihood Security

The Table 3 exhibited that in Anantapuram district the majority (86.67 %) of ATMA beneficiaries had increased their economic capital followed by 81.67 per cent of respondents had achieved in raising their human capital. Around 78.33 per cent of respondent beneficiaries enhanced their social capital. Only 48.33 per cent of respondents were able to develop natural capital. In East Godavari district majority of the respondents (86.67 %) augmented their economic capital. Nearly 86.67 per cent of respondents enriched their human capital. Social and natural capital was improved by 83.33 and 51.67 per cent of respondents respectively. To the whole, majority (87.50 %) of the respondents increased their economic capital followed by boosting in human (84.17 %), social (80.83) and natural capital (50.00 %). The reason for the changes in livelihood security capitals was might be the intervention of line and development departments in bringing changes in the respondent capitals through various farmer centric extension programmes and activities with the participatory approach.

Livelihood Outcome

From Table 3 the results revealed that in Anantapuram and East Godavari districts there was significant outcome in crop and enterprise intensification (88.33 % and 93.33 % respectively) followed by increase in production (85.00 % and 90.00 % respectively) and income (83.33 % and 88.33 % respectively) and realizing farm and enterprise diversification (81.67 % and 85.00 % respectively) and food security (76.67 % and 83.33 % respectively). Out of total sample the outcomes were observed in following manner. Majority (90.83%) of total respondents the outcome was fruitful in crop and enterprise intensification. Nearly 86.67 per cent of respondents achieved raise in production level. About 83.33 per cent of respondents succeeded in farm and enterprise diversification. Almost 82.50 per cent of respondents increased their income. Only 78.33 per cent of respondents attained food security. The reason for the achievements in livelihood outcome among the beneficiaries was the firm efforts of the ATMA functionaries in bringing quantified outcome in their livelihood.

Sustainable Livelihood Levels of ATMA Beneficiaries

The responses of the respondents were obtained and analyzed by using mean and standard deviation. Then the respondents were categorized into low, medium and high level categories based on sustainable livelihood levels. The distribution of respondents according to the sustainable livelihood levels is presented in Table 4.

Table 4: Distribution of Respondents based on Sustainable Livelihood Levels

S. No.	Category of farmers	Anantapuram (n = 60)		East Godavari (n = 60)		Overall (120)	
		F*	%	F*	%	F*	%
1.	Low	8	13.34	9	15.00	17	14.17
2.	Medium	44	73.33	39	65.00	83	69.16
3.	High	8	13.33	12	20.00	20	16.67
	Mean	16.1		16.5			
	Standard deviation	1.24		1.08			

F- Frequency

*** Multiple responses**

It could be elucidated from the Table 32 that sustainable livelihood levels of the ATMA respondents of Anantapuram and East Godavari districts was at medium level (70.00 % and 66.67 % respectively) followed by high level (18.33 % and 26.66 % respectively) and low level (11.67 % and 6.67 % respectively) of sustainable livelihood levels. More than half (69.16 %) of total sample of ATMA respondents had medium level of sustainable livelihood followed by high (14.17 %) and low levels of (16.67 %) sustainable livelihood levels.

The reasons for the medium level of sustainable livelihood of the farmers might be; farmers were able to increase and improve their capitals (natural, human, social and economic) for achieving livelihood security. They are also competent in appreciating their increased production and income through crop and enterprise intensification and diversification in a sustainable manner.

CONCLUSIONS

The objective of this paper is to assess the impact of ATMA on farmers livelihood. Sustainable Livelihood Approach was followed and developed suitable indicators based on the Sustainable Livelihood Framework that concentrates on livelihood assets and outcomes after a thorough literature review and experts consultation. The results revealed that 69.16 per cent of respondents had medium level of livelihood status. In the current situation like limited resources the farmers livelihood has to be improved by utilizing the available resources for getting sustainable profits through farm and enterprise intensification and diversification. It is very decisive for extension functionaries under ATMA to develop effective strategies and converging efforts in improving the farmers livelihood in sustainable perspective.

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APPENDICES

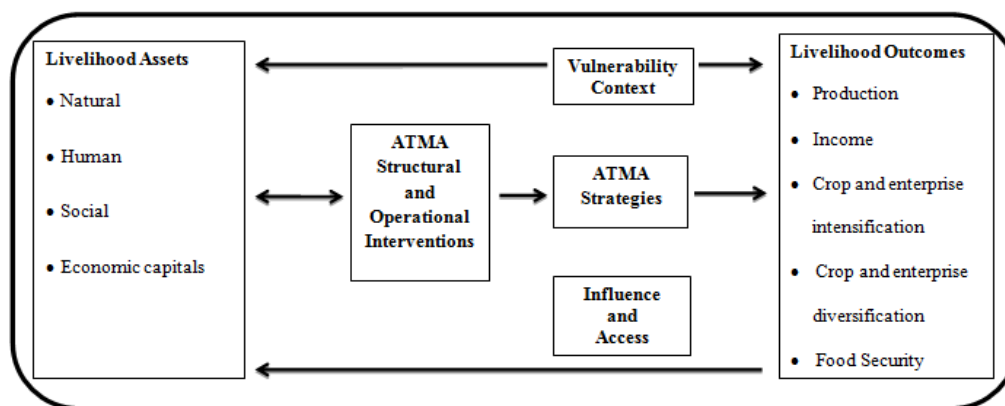


Figure.1: Sustainable Livelihood Analysis Framework
 (Source: Farrington *et al.*, 1999; Solesbury, 2003)